PATENT APPLICATION
Navy Case No.: 79,212

Enzymes are modified by incorporating anchor sites for linking the enzymes to a target surface without destroying the catalytic activity of the enzymes. A stable carrier to accommodate and bind the selected enzyme is constructed, and the enzyme is non-covalently linked to the carrier, generally through metal salts of iminodiacetate.

Please amend the claims as follows:

3. (Amended) A method for stabilizing enzymes comprising:

genetically engineering an enzyme to include a stabilizing amino acid substitution;

copolymerizing an amphiphile containing a salt selected from the group consisting of metal salts of iminodiacetic acid, nitrilotriacetic acid, and mixtures thereof with other polymerizable amphiphiles to form vesicles; and

binding the genetically engineered enzyme to the salts on the outer surface of the vesicles.

5. (Amended) The method according to claim 3 wherein the stabilizing amino acid substitution is selected from the group consisting of histidine and polyhistidine.

9. (Amended) A method for stabilizing enzymes comprising:

genetically engineering an enzyme to include a stabilizing amino acid substitution; and

attaching the stabilized enzyme to salt groups selected from the group consisting of metal salts of iminodiacetic acid, metal salts of nitrilotriacetic acid, and mixtures thereof on the surface of a particulate inorganic carrier.

11. (Amended) The method according to claim 9 wherein the carrier is a metal oxide ceramic particles that can be formed in the Stober process starting with a metal alkoxide precursor.

12. (Amended) The method according to claim 11 wherein the metal oxide particles are selected from the group consisting of silica, alumina, baria, titania, and zirconia.

15. (New) The method of claim 3 wherein the bound enzyme is capable of detoxifying a nerve agent.

16. (New) The method of claim 3 wherein the stabilizing amino acid substitution is at a binding site on the enzyme that is innocuous to the function of the enzyme.

17. (New) The method of claim 3 wherein the stabilizing amino acid substitution is at a binding site on the enzyme that is known to be innocuous to the function of the enzyme.

18. (New) The method of claim 5, wherein the stabilizing amino acid substitution is a terminal stabilizing amino acid substitution.

19. (New) The method of claim 9 wherein the stabilizing amino acid substitution is at a binding site on the enzyme that is innocuous to the function of the enzyme.

20. (New) The method of claim 9 wherein the stabilizing amino acid substitution is at a binding site on the enzyme that is known to be innocuous to the function of the enzyme.

21. (New) The method of claim 9, wherein the stabilizing amino acid substitution is a terminal polyhistidine.